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CHAPTER 1.0 APPROPRIATENESS OF MINIMUM NURSE STAFFING RATIOS IN NURSING HOMES: BACKGROUND, STUDY APPROACH, AND REPORT OVERVIEW[1]

1.1 Background

1.1.1 Congressional Requirement

The primary purpose of this study and Report to Congress is to meet the requirements of Section 4801(b)(7)(e)(17)(B) of Public Law 101-508:

> "Study on Staffing Requirements in Nursing Facilities.--The Secretary shall conduct a study and report to Congress no later than January 1, 1992, on the appropriateness of establishing minimum caregiver to resident ratios and minimum supervisor to caregiver ratios for skilled nursing facilities serving as providers of services under title XVIII [Medicare] of the Social Security Act and nursing facilities receiving payments under a State plan under title XIX [Medicaid] of the Social Security Act, and shall include in such study recommendations regarding appropriate minimum ratios."[2]

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[1] Author: Marvin Feuerberg, Health Care Financing Administration (HCFA). Editorial assistance provided by Jeane Nitsch, HCFA.

[2] Unfortunately, there does not appear to be any clarity to the Congressional intent of this one sentence requirement other than the plain language of the law itself. In the breakdown of what appears in the bill, the conference report doesn't mention that the Secretary has to prepare the staffing study. Instead it talks about (17)(A), which has to do with "standards for certain professional services." The review of the House Bill, however, doesn't mention (17)(A) ("standards for certain professional services"). The Senate amendment contained a provision called, "Standards for Certain Professional Services.--Requires the Secretary to conduct a study on the hiring and dismissal practices of nursing facilities with respect to social workers, dietitians, activities professionals, and medical records practitioners, and report to Congress by January 1, 1993, on whether facilities have on their staffs persons with significantly different credentials as a result of the new regulations that became effective October 1, 1990, and the impact of staff composition on quality of care." The conference agreement included, "the Senate amendment, with an amendment to require than any regulations promulgated by the Secretary on medically-related social services, dietary services, and an on-going program of activities include requirements that are at least as strict as those applicable to providers of these services prior to the enactment of OBRA '87. The agreement also deletes the requirement for the Secretary to conduct a study on the hiring and dismissal practices of nursing facilities with respect to social workers, dieticians, activities professionals, and medical records practitioners." And, that's all it says. The conference agreement does not indicate what happened to the portion of the Senate amendment that required the study to focus on the impact of staff composition on quality of care; either that was abandoned, or it became the seed from which grew the current requirement

The Federal Reports Elimination Act of 1998 extended the due date of this Report to January 1, 1999. Unfortunately, a number of factors have contributed to the continued delay in completing this study and report. First, a sufficiently large and reliably accurate sample of Minimum Data Set (MDS) data to construct outcome measures only became available during the past five years. In addition, constructing the outcome measures file with these early and not fully standardized data has proved more difficult than anyone anticipated. Second, an internal interim report that was completed intramurally in October, 1996 indicated that this was an extremely complex study.[3] A very comprehensive study would be required and the assistance of an external evaluation contractor would be needed. Consequently, more delays were incurred in the procurement process of securing funding, appropriate review, and selecting an evaluation contractor.

1.1.2 Public Concern With Nursing Home Staffing

A number of recent reports by the U.S. General Accounting Office, the U.S. Office of the Inspector General, and HCFA's massive July 1998 nursing home Report to Congress have identified a range of serious problems including malnutrition, dehydration, pressure sores, abuse and neglect.[4] Recent hearings before the U.S. Senate Special Committee on Aging, including a November 3, 1999, forum, have pointed to nurse staffing as a potential root cause of many of the problems observed. Along with concerns with enforcement, staffing has emerged as the largest single concern of many consumer advocacy and labor groups including the National Citizens' Coalition for Nursing Home Reform; the National Senior Citizens Law Center; American Association of Retired Persons; the National Committee to Preserve Social Security and Medicare; American Federation of State, County and Municipal Employees; and the Service Employees International Union. In addition, there has been a heightened public concern with this issue due to the continuous flow of newspaper articles and television news reports highlighting inadequate care and abuse in nursing homes.

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for the staffing study. Whatever the case, it seems that there is no additional information about Congressional intent to be had from perusing the conference report. Indeed, there is nothing in the requirement for the study and the conference report that explicitly would limit the study to *nurse* staffing ratio(s), although that is the assumption of our effort.

3 Feuerberg, M., Mortimore, E., Kramer, A., "HCFA Study on Appropriateness of Minimum Nurse Staffing Ratios - Interim Report," Health Care Financing Administration, October, 1996, Baltimore, Maryland.

4 Nursing Homes: Additional Steps Needed to Strengthen Enforcement of Federal Quality Standards: Report to the Special Committee on Aging, U.S. Senate, U.S. General Accounting Office, (HEHS-99-46), March 1999; "Nursing Home Survey and Certification: Deficiency Trends," U.S. Office of the Inspector General, Department of Health and Human Services, (OEI-02-98-00331), March 1999; See Report to Congress: "Study of Private Accreditation (Deeming) of Nursing Homes, Regulatory Incentives and Non-Regulatory Initiatives, and Effectiveness of the Survey and Certification System," Health Care Financing Administration, July 1998.

For the advocates, the link between staffing and quality problems is manifest: "Advocates have long known that poor care -- both neglect and out-right abuse -- are directly tied to poor staffing. When one CNA (Certified Nursing Assistant) is responsible for 25 residents during a shift, it stands to reason that many people may not be given fluids, toileted, or turned during those eight hours. Even the most well-meaning and caring CNA cannot attend to the needs of residents when taking care of too many people. As the needs of nursing home residents have become more and more complex, nursing homes have continued to be staffed at low levels."[5]

For the provider associations, in contrast, the link between staffing, particularly mandatory staffing ratios, and quality is far more complex. They point to underlying problems of a chronic short supply of potential nursing home workers, the difficulty of establishing universal mandatory ratios for different types of staff, and facilities with residents of differing acuity and functional limitations. Most importantly, the providers point to the contradiction of legislators demanding higher staffing and quality standards while providing low, inadequate reimbursement levels. The American Association of Homes and Services for the Aging (AAHSA) argues that increased staffing in not an effective strategy for the attainment of positive outcomes: "The measure of a nursing facility's ability to successfully meet its residents' needs must be based on actual performance rather than on the potential capacity of the facility to provide appropriate services. AAHSA believes that the impetus provided by OBRA '87 to shift the focus from paper compliance to resident outcomes has gone a long way toward ensuring the provision of optimal quality care to all residents of skilled nursing facilities and nursing facilities."[6]

In a more recent statement, AAHSA's Board of Directors, while still emphasizing outcome measurement, also appear to accept minimum staffing requirements provided reimbursement is adequate: " . . . the (AAHSA) Board agreed that . . . the field of outcomes measurement in health care, including long term care, is in its infancy and it will take time to reach . . . a gold standard. In the meantime, *we need good proxies to ensure that the elements of quality are in place*. *Staffing is perhaps the most important of these elements.* We believe there should be levels at which facilities are required to staff; that those levels should be based on sound methodological research and, further, provided that reimbursement rates are based upon those levels. We do not believe such a methodology exists and we would support an effort to create one that considers factors such as case

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5 National Citizens' Coalition for Nursing Home Reform. News Release. October 29, 1999.

6 American Association of Homes and Services for the Aging. Statement before United States Senate Special Committee on Aging, A Forum on Nursing Home Residents: Short-Changed by Staff Shortages? November 2, 1999. See also the Written (forum) Statement of Judith A. Ryan, President and Chief Executive Officer, The Evangelical Lutheran Good Samaritan Society, on behalf of the American Health Care Association which emphasized that reimbursement must support adequate staffing.

mix, physical layout, and other factors."[7]

In response to this public concern, particularly from consumer advocates and their families, at least 37 States have imposed new, more stringent staffing requirements under their State licensure authority, and 19 States have introduced State legislation in this area. Further, at least 10 States now explicitly tie some portion of their Medicaid payment rate to staffing levels or wages.[8]

1.1.3 HCFA'S Authority/Role in Nurse Staffing Study

1.1.3.1 Nursing Home Conditions of Participation

Over 95% of U.S. nursing homes participate in the Medicare and/or Medicaid program. For all residents in these program certified homes, it is HCFA's responsibility to ensure that the health and safety of one of the nations' most vulnerable populations is protected. To this end and under the statutory authority of OBRA '87, HCFA has issued many regulations and guidelines. Although some of these regulations refer to nurse staffing requirements, there is some concern that HCFA's current requirements in this area may be inadequate; hence, the need for this study.

1.1.3.1.1 HCFA's Nurse Staffing Requirement

Currently, the Social Security Act (The Act) mandates certain nurse staffing requirements in long term care (LTC) facilities. The *general* requirement is that nursing homes must provide ". . . sufficient nursing staff to attain or maintain the highest practicable . . . well-being of each resident . . ." Many professionals view this general requirement, when implemented in practice, as too vague to serve as an adequate Federal standard. There are also *specific minimum* requirements of 8-hours registered nurse and 24-hours licensed nurse coverage per day. However, since this minimum is the same for all facilities (e.g., the same for a 60 bed facility or a 600 bed facility) many professionals also view this requirement as inadequate; they argue for a required minimum nurse staffing to resident *ratio*. In addition, many professionals recommend minimum nurse staffing ratios that would be adjusted upward for nursing homes with residents who have greater care needs, such as patients who suffer from Alzheimer's Disease and others with fragile medical conditions. The Congressional requirement for this

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[7] "Nursing Homes: Additional Steps Needed to Strengthen Enforcement of Federal Quality Standards: Report to Special," Report to the Special Committee on Aging, U.S. Senate, U.S. General Accounting Office, (HEHS-99-46) March 1999; "Nursing Home Survey and Certification: Deficiency Trends," U.S. Office of the Inspector General, Department of Health and Human Services, (OEI-02-98-00331), March 1999; See Report to Congress: "Study of Private Accreditation (Deeming) of Nursing Homes, Regulatory Incentives and Non-Regulatory Initiatives, and Effectiveness of the Survey and Certification System," Health Care Financing Administration, July 1998.

[8] See Chapter 2 for a more detailed discussion.

study, described above, essentially asks the Secretary to determine in there is some appropriate ratio of nurses to residents.

1.1.3.2 Evaluation Contractors

In September 1998 we had an opportunity to modify with end-of-the-year funds an existing contract with Abt Associates to assist us with the staffing study. We did just that in order to move this project forward. One consequence of this process was that the study design and a more detailed set of tasks and cost estimates had to be generated after the contract modification was awarded. This, and the difficulty of securing the necessary data, has caused some delays, as noted above. Important subcontractors and/or consultants to Abt on this project include: University of Colorado Health Sciences Center, Andrew Kramer, MD, Principal Investigator; University of California, Los Angeles, Anna & Harry Borun Center for Gerontological Research, John F. Schnelle, Ph.D., Director and the UCLA Principal Investigator; Survey Solutions, Inc., Beth A. Klitch, President; Rosalie A. Kane, Ph.D., Division of Health Services, Research, Policy and Administration at the University of Minnesota School of Public Health; Barbara B. Manard, Ph.D., Principal, the Manard Company, Chevy Chase, Maryland.

In addition, Mick Cowles, President, Cowles Research Group provided Online Survey and Certification Reporting (OSCAR) system data files, and Fu Associates has assisted with the development of analytic working files utilizing MDS and claims data for the outcome measures. Finally, HCFA staff have been responsible for much of the study design, implementation, and analyses employed throughout the project. In addition, HCFA staff have integrated all the various analyses into this Phase 1 final report.

1.1.4 Institute of Medicine (IOM) Report

A 1996 report on nurse staffing by the IOM recommended a higher nursing home minimum (not a minimum ratio) of 24-hour registered nursing care.[9] It was not prepared, however, to recommend a minimum ratio, in part because there was not sufficient knowledge to appropriately adjust any recommended ratio by the case-mix of the patient population. Although the need for increased staff may seem intuitively obvious, the empirical evidence in support of this general position and *support of specific ratios* is fragmentary. Although the IOM report provided some additional information, the essential question raised by the OBRA '90, whether there exists an appropriate minimum ratio, remains unknown; hence, the need for this study.

1.1.5 Technical Expert Panel (TEP)

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[9] Institute of Medicine, 1996. *Nursing Staff in Hospitals and Nursing Homes: Is it Adequate?* National Academy Press, Washington, DC.

Abt Associates convened a Technical Expert Panel (TEP) to function as a sounding board for study plans and results by reviewing and commenting on key project deliverables, such as design plans for and results of technical analyses. The TEP was comprised of nationally recognized experts in LTC, nursing, economics, and research and analysis. Individual members were nominated to the TEP because of their expertise in staffing related issues, and because they had not demonstrated a commitment for or against minimum staffing standards, as it was imperative that the TEP not be biased in their review of study plans or results.

While the reviewers are all experts in long term care, they represent very different disciplines and areas of expertise we view as critical to this study. These areas are nursing and qualitative research, quality indicators, clinical expertise, and cost analyses. Nursing knowledge and experience are also well represented among HCFA and our contractors' staff. There are seven individuals working on some aspect of this study who are a RN or hold a Master's-level nursing degree, several of which have worked in nursing homes as a Director of Nursing, charge nurse, or staff nurse.

The TEP members for the staffing study include:

Barbara Bowers, Ph.D., RN
School of Nursing
University of Wisconsin-Madison

John Nyman, Ph.D.
Professor, Division of Health Services Research and Policy
University of Minnesota

Charles Phillips, Ph.D.
Director and Senior Research Scientist
Myers Research Institute
Menorah Park Center for the Aging

Eric Tangalos, MD
Chair, Division of CIM & Professor of Medicine
The Mayo Clinic

The scope of work for the TEP included formal review and written comments on the design plans and outcomes for three of the major study analyses including: 1) the reliability and validity analysis of OSCAR and Medicaid Cost Report Data conducted by Abt Associates: 2) the staffing and outcomes analyses conducted by Andrew Kramer, M.D. and staff at the University of Colorado; and 3) the "time/motion" analysis for best care practices conducted by Jack Schnelle, Ph.D. at the University of California, Los Angeles.

The initial intent of the TEP was to minimize in-person meetings and rely instead on written comments and conference calls to conduct the work of the TEP. As such, after written comments on all draft documents were submitted to Abt Associates by the TEP (and are, therefore, maintained as part of the formal study record), conference calls were conducted among the TEP, and staffs at HCFA, Abt Associates, and the University of Colorado to review and respond to TEP comments. Ultimately, in-person TEP meetings were not required as the written comments/conference call method of conducting the TEP business was very successful in obtaining thorough, thoughtful, and timely review of key study deliverables. As a final requirement for participation on the Panel, TEP members were required to keep confidential all study plans and results and were not allowed to disseminate study documents outside of the TEP.

As noted above, the formal TEP was required to review and provide input into study plans and results of the study analyses. As such, written TEP comments served as the basis for conference call discussions between the TEP, and staff from Abt Associates, the University of Colorado, and HCFA. To the extent possible, TEP comments on design plans and draft reports were incorporated into the final reports submitted to HCFA. Where TEP comments or suggestions for revisions to the analyses could not be incorporated, a justification was provided for why the suggested change could not be made.

The TEP provided a thorough review of the design plan for development of the staffing measure that would ultimately be used as the basis for the staffing and outcomes analyses. The development of the staffing measure was based on a reliability and validity analysis of OSCAR and Medicaid Cost Report data to determine which source of staffing data was the most accurate. At the time of the TEP review, the analysis plan for development of the staffing measure centered mainly on tests of concurrent validity of OSCAR and Medicaid Cost Report data. However, shortly after the TEP review of this design plan, an opportunity to collect payroll data from a sample of nursing homes was operationalized, and the resulting data became the "gold standard" measure against which the reliability and validity of the OSCAR and Medicaid Cost Report data could be assessed. Therefore, TEP comments on the original design plan were immaterial. However, TEP members did agree with the purpose for utilizing payroll data and the methods for obtaining the data to assess the validity of the OSCAR and Medicaid staffing data.

The TEP commented on both the design report and the draft chapters of results from the analysis of outcomes and staffing (Chapters 9, 10, and 11). The design report contained discussion of the specific quality measures to be used, data sources, and analytic methods. The TEP supported the overall design, including conducting the analyses with the facility as the unit of analysis rather than an individual resident, and the proposed methods for determining associations between staffing and quality. The TEP suggested that certain potential quality measures that were included in the report were likely to be susceptible to coding inaccuracies (e.g., hospitalizations for drug reactions, which would be coded as poisoning), and were subsequently dropped from the analyses. The TEP supported the strategy of not controlling for facility characteristics that were strongly associated with staffing because these would

diminish the relationships between staffing and quality. However, the TEP suggested another market-area covariate that should be included in the analysis -- health service area occupancy rates -- which was subsequently used in the analysis. Finally, the TEP suggested that the analyses focus only on the best source of staffing data, Medicaid Cost Reports, rather than both sources, and by emphasizing the analyses for particular years and quality measures.

With respect to the results, the consensus among TEP members was that the study identified significant relationships between staffing levels and important markers of quality. For several quality measures, some of the TEP members argued that the final draft should more clearly show how quality might be attributable to these staffing levels. Other issues that could affect quality were raised by TEP members, including: facility staffing budgets/costs, amount of physician care, and the extent of competition among facilities due to market-area occupancy rates. When possible, these suggestions were addressed, however, in the analysis complete data on physician care and staffing costs which are likely to reflect nurse staffing levels were not available. TEP members also noted not all domains of quality were covered by the analyses and that the study was limited to three States, and therefore the results may not be fully generalizable. These issues were addressed in the final report chapters.

1.1.5.1 Stakeholders Input

In addition to the formal, organized TEP, Abt Associates utilized other methods for seeking and obtaining input from different stakeholders in the LTC staffing debate. These included official meetings with stakeholders and informal conversations with policy experts not formally included on the Abt TEP. Stakeholder meetings were conducted with representatives of: the American Health Care Association; the American Association of Homes and Services for the Aging; the National Citizens Coalition for Nursing Home Reform; the National Committee to Preserve Social Security and Medicare; the National Senior Citizens Law Center; the Direct Care Alliance/Paraprofessional Healthcare Institute; the Services Employees International Union; the American Federation of State, County, and Municipal Employees; and the Food and Allied Services Trade of the AFL-CIO. Informal conversations were periodically conducted with Charlene Harrington, Ph.D., University of California at San Francisco; David Zimmerman, Ph.D., University of Wisconsin at Madison; William Painter, then with the Alzheimer's Association of South Carolina; Genevieve Gipson, RN, MEd, Director of the Career Nurse Assistants' Program; and others.

1.2 Study Approach

1.2.1 Study Objectives

The study will determine: 1) if minimum nurse staffing ratios are appropriate; and, if appropriate; 2) the potential cost and budgetary implications of minimum ratio requirements; and 3) if there are nurse staffing ratios that strongly determine good or *optimal* resident outcomes. In this report, the phrase

"nurse staffing" refers to all three categories of nurses: Registered Nurses (RNs), Licensed Practical Nurses (LPNs), and Nurse Aides/Nursing Assistants.

These objectives are formulated to be responsive to the Congressional language requiring the study. As such, they appear reasonable and straight-forward. There are, however, some potential policy issues embedded in the objective of determining if there are *appropriate* minimum nurse staffing ratios. The policy perspectives defining "appropriate" has important implications for how the study questions are formulated and empirical analyses conducted.

1.2.2 Study Question: How Should Appropriateness be Defined?

Although the Congressional language requiring the study is clear, it is sparse and necessitates that we operationalize "appropriateness" so that we can formulate a study question open to empirical investigation. Consistent with this objective, the core analysis of this study presented in Chapters 9 through 12 have defined the key study question: *Is there some ratio of nurses to residents below which nursing home residents are at substantially increased risk of quality problems?* This key study question does not simply seek to determine if there is a generally positive relationship between staffing and quality outcomes. The questions ask if there is some critical nurse to resident staffing ratio, a *threshold*, below which residents are at substantially increased risk of quality problems. If strong evidence is found supporting the existing of these nurse staffing ratio thresholds, then this finding in turn seemingly provides support for a regulatory minimum ratio requirement. Of course, the appropriateness of establishing a new regulatory minimum would also have to assess the costs, feasibility of implementation, and other considerations which are the subject of a Phase 2 study and report to Congress (see discussion below). What is important to note here is that this conceptualization of appropriateness is what is expected from a regulatory agency; regulatory standards are typically *minimal* standards.

The "appropriateness" of minimum staffing ratios, however, could be defined as the staffing threshold required to attain good or optimal quality outcomes, as opposed to avoiding bad outcomes. This focus on optimal outcomes is analogous to how this question of appropriate ratios has emerged in education with respect to assessing the effect of classroom size reductions. Here the emphasis has been on determining the *optimal (not a minimum)* ratio of students to teachers which has been found to be somewhere around 15 students per teacher, at least for the lower grade levels.[10]

Although the definition of appropriateness as minimal ratios, implicit in the analysis of Chapters 9 through 12, is consistent with normal regulatory standards, the alternative definition of appropriateness

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[10] See Eric A. Hanushek (1999). Some Findings From an Independent Investigation of the Tennessee STAR Experiment and From Other Investigations of Class Size Effects. *Educational Evaluation and Policy Analysis, Summer 1999, Vol. 21, No. 2, pp. 143-163.*

as optimal ratios would seem consistent - even required - by current statutes and regulations. As discussed in greater detail in Chapter 4, The Omnibus Budget Reconciliation Act of 1987 (OBRA '87) provided amendments to the Social Security Act (SSA) for Skilled Nursing Facilities (SNF) and Nursing Facilities (NF). The statutory language throughout these amendments and regulations and guidelines promulgated under OBRA '87 placed emphasis upon providing the scope of care and services (including sufficient qualified staff) for a resident residing in a LTC facility to assure that each resident could attain and maintain his/her highest practicable physical, mental, and psychosocial well-being. Hence, it would appear that HCFA's *current* staffing regulations, particularly the general regulation requiring ". . . sufficient nursing staff to attain or maintain the highest practicable . . . well-being of each resident . . .," are intended to provide appropriate care conceptualized as an optimal standard, not a minimal standard. With respect to this conceptualization of appropriate as applied to nurse aide staffing, the analysis presented in Chapter 14 is consistent with identifying a minimum ratio for attaining optimal quality outcomes.

1.2.3 Staffing Question Not Addressed

It can be argued that the study question of appropriate nurse staffing ratios is not the right question for developing a more effective policy in this area. One of our TEP members, John Nyman, an economist, noted several analytic problems in this study with its focus on staffing ratios:

> . . . An alternative approach that may be cheaper and better withstand scrutiny of opponents is to use the cost reports (or similar data) to determine the nursing costs associated with a certain minimal outcome/quality level. That is, the total nursing or nursing-like personnel costs could be obtained for a firm at an aggregated level. A number of sources could provide these data. Once these costs are determined, they could be used in a regression analysis to determine the marginal nursing cost of treating a patient (case-mix adjusted) in a nursing home that has achieved a certain minimum quality level as determined by the firm's history. Once this nursing cost is established, HCFA could require that nursing homes spend that much on nursing inputs.
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> Certain existing requirements for RN hours may be retained, and there may be an adjustment for the general level of nursing wages in the market in which the nursing home is located. Still, this approach is more doable than the former and allows the nursing home to respond to relative wage differences/changes in the market, whereas minimum staffing ratios would not. Moreover, it does not require that the analyst focus on those nursing homes at the tail of the staffing distribution, where outlier status, bad management, and data errors are virtually indistinguishable. Furthermore, by using the more aggregated cost figure, some of the differences in staffing due to variation in accounting conventions across firms, or due simply to

errors in categorizing costs, would be avoided.[11]

Apart from a number of analysis problems with identifying minimum nurse staffing thresholds, Nyman appears to maintain that a regulatory policy based on this analysis isn't economically efficient, even if staffing thresholds are identified. An analysis seeking to identify minimum costs/expenditures necessary for achieving a minimum level of quality would permit firms to respond to relative wage differences in the market and facilitate the most efficient allocation of inputs. Efficient allocation may include not only substitution between nursing categories (e.g., RN and LPN), but also between nursing and non-nursing staff. As discussed in Chapter 6, these other relevant non-nursing staff include dietary staff, housekeeping staff, social service staff, activities staff, and therapy staff. Although this alternative approach may have some advantages, it is not the question Congress asked us to address.

1.2.4 Isn't it Obvious that Low Staffing is Related to Quality Problems?

Although the link between low staffing levels and quality problems may seem intuitively obvious, there is no necessary connection. Of course, we know that if all the nursing staff were removed, residents would not miraculously return to good health and functioning. Clearly, at *some* ratio of nurse staffing substantially increased levels of quality problems would occur. But there is no apriori reason, apart from empirical evidence, to assume that any or a substantial portion of nursing homes actually staff at these critically low levels.

It should also be noted that nurse to resident staffing ratios are only one aspect of staffing. In addition to numbers of staff, there are other dimensions of staffing that may impact quality outcomes. These other factors, while outside the scope of this study, include wages/benefits, training, supervision (and respect), career ladders, allocation of staff, scheduling, and a host of staff organizational factors which are discussed in Chapter 6.

Finally, as noted above, the evidence from currently published research on the link between staffing and outcomes and *supportive of specific ratios* is fragmentary (see Chapter 6). Even the Institute of Medicine's latest report was not prepared to recommend minimum ratios; hence, the need for this study.

1.2.5 Three Basic Research Strategies

1.2.5.1 Review of Research and Expert Consensus

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[11] John A. Nyman, University of Minnesota. Comments on "Skilled Nursing Facility Staffing Study Design Plan for Development of the Staffing Measure," May 12, 1999.

We have identified three basic research strategies for addressing the key study question of appropriate minimum nurse staffing ratios. The first strategy critically reviewed selected research on the relationship between staffing and resident outcomes. This first strategy also considered the findings and recommendations of an expert panel. This panel, consisting of leading nurse researchers, educators and administrators in long-term care, consumer advocates, health economists, and health services researcher knowledgeable about nursing homes, were convened for a 1-day conference at the John A. Hartford Institute for Geriatric Nursing, Division of Nursing, at New York University in April 1998. A review of the conference and their recommendations are discussed in Chapter 6. Although we think this approach has merit, it also has some serious limitations, particularly given that the research upon which they based their recommendations is itself seriously limited.

1.2.5.2 Empirically Determining the Relationship Between Staffing and Quality Problems

This strategy consists of selecting a representative sample of nursing homes, generating measures of nurse staffing and quality outcome measures that are hypothesized to be linked to nursing inputs, and statistically determining the relationship between the two sets of measures while controlling for extraneous factors that could lead to spurious findings. Essentially this is a straight-forward multivariate statistical analysis. There are, however, some very difficult problems that must be addressed with this kind of analysis. Obtaining reasonably accurate measures of nurse staffing has proven a more difficult task than suggested by the simple counting of staff. A broad range of outcome measures that might reflect the impact of different kinds of nursing staff (e.g., Registered Nurses, Licensed Practical Nurses, and Nursing Assistants or Aides) is needed for this analysis. In addition, as a practical matter, it must be possible to generate reasonably accurate outcome measures from all ready existing (secondary) data.

The most difficult problem with this approach is the statistical modeling of the relationship between staffing and outcomes. A negative outcome alone is not an adequate measure; it is important to risk adjust so that there is confidence that a negative outcome can be attributed to care processes received in the nursing home, not a condition present upon admission or due to an unavoidable disease process. Adequate risk adjustment must also be accomplished within the limitations of the available data from claims and the Minimum Data Set (MDS). In addition, it is important to control for the possibility that the most fragile and medically needy residents may be deliberately sent from the hospital to higher staffed nursing homes which have the ability to provide special services, such as intravenous care. These residents, however, because they are more vulnerable, are more likely to have an adverse outcome, independent of the care they receive in the nursing home. Hence, these circumstances could lead to the conclusion that the highest staffed facilities have the worse outcomes. It is important that the statistical analyses control for this possibility and avoid an erroneous conclusion.

1.2.5.3 Time-Motion Approach to Setting Nurse Staffing Standards

The approach, what we broadly characterize as a "time-motion" method, attempts to identify the time it takes to complete nursing tasks for nursing home residents. These times are (somehow) aggregated to the level of the facility and the nurse staffing required to provide this level of care is determined. The staffing algorithms derived from this method are adjusted for differences in the kind and intensity of care needed by residents with differing levels of acuity and functional limitations.

As a method of deriving appropriate nursing staffing standards, it is intuitively understandable, particularly to those who find the statistical modeling of the empirical approach to be too complex, or suspect. If what nursing staff actually do impacts on some important resident outcomes, an assumption that would be hard to reject, then it would seem reasonable to determine how much time it takes to perform these necessary nursing tasks and the consequent staffing implied by this allocation of time.

Determining the time required to perform nursing tasks is more difficult than it might seem at first glance. Residents with different medical conditions and functional limitations have different nursing needs. These needs can also change over time, as a resident enters the nursing home, very often from the hospital, and their stay can continue for several years.

1.3 Report to Congress Overview

1.3.1 Phase 1 and Phase 2 Report

It was recognized from the beginning of this study that not all the necessary analyses to provide a definitive answer to the three basic study objectives noted above could be addressed within the funding constraints of the current contract modification with Abt Associates. In particular, it has been recognized that a cost analysis could be required, and this possibility could not be assessed until we had some preliminary results indicating that low staffing ratios have a strong and consistent impact on resident quality outcomes. It also became clear that it was important to provide to Congress some response to this long-standing Congressional concerns with nursing home staffing. Accordingly, a decision has been made to divide the study and Report to Congress into a Phase 1 and Phase 2 report. The Phase 1 analyses are reported here.

1.3.2 Phase 2 Analyses

As will be demonstrated in subsequent Chapters, the Phase 1 results indicate that there are (low) nurse to resident ratios strongly related to quality problems. These results would seem to support the "appropriateness" of a minimum ratio requirement. However, these results are tentative. Additional analyses need to be conducted before we can fully assess the appropriateness of specific minimum ratio requirements that adjust for the case mix of residents. Specifically, the Phase 2 analyses will conduct the following five basic analyses/tasks:

- Identification of Specific National Optimal Staffing Ratios

  Even if *some* minimum ratio is appropriate, the analysis completed for the Phase 1 report is unable to identify *specific optimal* ratios. These ratios would have to be fully tested on more States, with more current data, with a sample that does not exclude Medicare-only facilities, and with more refined case mix classification methods than were tested in the Phase 1 report.

- Qualitative Case Studies

  A number of important questions cannot be fully address with the largely quantitative analysis of secondary data found in the Phase 1 analysis. Needed case studies will consist of site visits to a sample of nursing homes in each of the targeted States to better understand the relationship between staffing and quality found in Phase 1 study. Although it is clear from the Phase 1 analyses that staffing numbers alone have an important impact on quality problems, there is research support that other staffing issues may also effect quality of care including: 1) turnover rates -- annual turnover rates in nursing homes are extremely high – in some cases exceeding 100 percent for aides and 60 percent for Directors of Nursing; 2) wages and benefits; 3) staff training; 3) career paths for nurse aides; and 4) management of staffing resources (e.g., allocation of staff across shifts and units). To the extent possible, these other aspects of staffing will be examined in the Phase 2 case studies.

- Cost Analyses

  These analyses will detail the costs associated with various possible study recommendations for a regulatory requirement of minimum nurse staffing ratios. The cost analysis shall include an assessment of the impact of regulatory changes on providers and payers, including program costs to Medicare and Medicaid. It will also include offsetting cost savings that may result from reducing the rate of avoidable hospitalizations.

- Workforce Analysis

  Even if the inherent cost increases in higher staffing levels could be absorbed by providers and other payers, it may not be possible to secure the necessary nursing staff at realistic wage levels. There is a widespread recognition of a nurse staffing shortage for both nursing homes and hospitals. The nature and extent of this nursing shortage will be integrated in some fashion with the cost analyses.

- Development of Accurate Staffing Data

  As will be shown in Chapter 3, the only ongoing source of uniform data on nursing home

staffing throughout the U.S. is HCFA's On-Line Survey Certification and Reporting System (OSCAR) data. Unfortunately, the evidence presented in Chapter 7 indicates that these self-reported data are highly inaccurate. Yet, the accuracy of these data is important. First, HCFA is committed to provide this kind of information to consumers -staffing data should be placed on the Web. This reason alone warrants a new effort to report acceptably accurate nurse staffing data. Second, the results from one analysis in the Phase 1 Report indicates that relatively higher than average nurse aide staffing levels are a necessary condition for attaining good or optimal resident outcomes. Although it is unlikely that these higher levels would ever be established by HCFA as a minimum requirement, consumers arguably have the right to select homes with this standard in mind. Third, and most important, the preliminary results of the Phase 1 analysis indicate that a new minimum ratio requirement may be necessary for avoiding poor quality outcomes. Although costs would have to be considered (see above), the current inaccuracy of the OSCAR data precludes implementing a minimum nurse staffing requirement even it HCFA were to decide that it was appropriate. Under these circumstances, accurate staffing data will be necessary in order to monitor compliance with this new standard.

1.3.3 Phase 1 Chapters Overview

The 14 chapters to this Phase 1 report can be viewed as linked by three organizing principles: background, core outcomes analyses, and time-motion analyses. Although for any given chapter there are topics discussed in more detail, each chapter can be read as a stand-alone statement.

1.3.3.1 Background and Policy Context.

This first chapter and Chapters 2 through 6 provide a background and policy context for the study. Chapter 2 examines public policy and how it currently effects nurse staffing directly through quality regulations, including explicit nurse staffing standards, and indirectly through Medicare and Medicaid payment rates. Chapter 3 presents a detailed analysis of current levels and trends of nursing home staffing in the U.S. and examines three policy related issues in light of these staffing levels: the number of facilities that would be impacted if the Hartford recommended standards were imposed; a test of whether minimum staffing requirements have the unintended consequence of reducing the staffing levels in otherwise better staffed nursing homes; and, an examination of whether the nursing homes under chain ownership, particularly bankrupt chains which have filed to reorganize under the protection of the bankruptcy court, may have reduced their staffing levels in response to their financial vulnerability.

Chapter 4 and Chapter 5 provide additional background and policy relevant analyses. Any recommendation for or against a minimum nurse ratio requirement will make explicit or implicit assumptions about how HCFA's current non-ratio requirements are working in practice. One of the

difficulties in setting a minimum ratio requirement is that no analysis conducted to date has been able to derive appropriate minimums that adjust for differences among facilities in the acuity and functional limitations in their resident populations. Given these circumstances, surveyors have difficulty in applying the current regulation for sufficient staff in which they must identify a failure to meet resident needs and determine if there is sufficient staff to meet those needs. Hence, it is important to assess whether surveyors can in fact make this difficult determination based on the application of the regulation as written. The purpose of the analysis in Chapter 4 is to determine through an examination of staffing citations how HCFA's current non-ratio nursing home nurse staffing requirements are being implemented and assessed. In addition, there is an assessment of how the implementation of these requirements may have been altered by recent State Operations Manual (SOM) revisions which incorporated an investigatory protocol related to nurse staffing.

Chapter 5 presents the results of focus groups discussions with direct care workers, Nurse Aides (NAs), and interviews with nursing facility management. Topics discussed include: staffing issues, including how staffing schedules are determined and the extent to which NAs have input into those schedules; their facility's processes for handling vacancies left when staff call out sick and dealing with absenteeism; the effects of short staffing on residents and on direct care workers; and ways in which facility management might be able to reduce absenteeism.

Chapter 6, the last "background" chapter, provides a transition to the outcome analyses. We critically reviewed selected research on the relationship between staffing and resident outcomes as well as the Hartford recommendations and other research on the impact of other non-ratio workforce factors on quality of care outcomes. There is also a review of research on the link between staffing and quality of life outcomes.

1.3.3.2 Core Outcomes Analyses

Chapters 7 through 12, in a sense the core analysis of this Phase 1 report, present all the analyses that constitute the empirical approach of the second research strategy discussed above. Chapter 6 presents the analysis assessing the validity and reliability of the OSCAR staffing data. Key to this analysis is a comparison for a sample of facilities, the reported OSCAR data with "gold standard" measures of nurse staffing independently collected from payroll records and invoices from the use of contracted agency services. Chapter 8 continues this analysis and assess whether the OSCAR data or staffing data from Medicaid cost reports are more accurate. The Medicaid Cost Report data are found to be superior and are utilized in the analyses presented in Chapters 9,10, and 12.

Chapters 9 and 10, each present for the three study States (New York, Ohio, and Texas) a statistical analysis of the link between the Medicaid Cost Report staffing data and a different set of outcome measures derived from secondary data, namely claims and MDS data. The outcome measures for Chapter 9 utilize claims data and new nursing home admissions capture transfers from the nursing home

to the hospital for congestive heart failure (CHF), electrolyte imbalance, respiratory infection, urinary tract infection (UTI), and sepsis. These diagnoses were chosen because of their prevalence and the potential for avoiding hospitalization in these areas with appropriate care.

Chapter 10 presents the effects of nurse staffing on selected quality measures for long term care nursing home residents derived from the MDS. In these analyses, three quality measures are utilized, two of which represented quality of care domains and one representing quality of life. These are: improvement in ability of perform activities of daily living, pressure ulcer incidence, and improvement in resisting assistance with activities of daily living which captures the degree to which residents are rushed or treated roughly, or have to wait for assistance.

Chapter 11 presents the results of an analysis linking OSCAR staffing data to quality outcome measures derived from primary data collected independently by the University of Colorado to assess quality of care in nursing homes. Trained nurse evaluators collected the data via chart reviews, direct observation, and staff interviews. The analysis focused on two of these measures,- inappropriate weight loss and resident cleanliness and grooming, that were most likely to be related to staffing and not independently measured in other data sources.

Chapter 12, the last chapter of this core outcomes analysis, draws on the analyses of the preceding chapters to address the following four questions: 1) Do nurse staffing ratios exist below which the likelihood of poor quality care is substantially increased?; 2) Do these analyses suggest certain levels than on average may be important to achieve?; 3) What attributes of case mix are important to take into consideration in determining staffing levels?; and 4) How might case mix be taken into consideration when applying staffing requirements?

1.3.3.3 Time-Motion Analyses

Chapter 13 examines three time-motion methods for setting nurse staffing levels: the U.S. Army Workload Management System for Nursing (WMSN); William Thoms' "Management Minutes" system; and HCFA's Staff Time Measurement (STM) studies on nursing care in nursing homes performed from 1995 to 1997. We found all three of these particular efforts of little value for setting staffing standards. However, in spite of numerous problems, we think the time-motion approach has merit. A very inventive and entirely new analysis applying this time-motion approach is presented in the last chapter of the Report.

The analysis in Chapter 14 essentially asks how much nurse aide time is required to implement five specific, daily care processes that have been linked to (good) resident outcomes: repositioning and changing wet clothes, repositioning and toileting, exercise encouragement/assistance, feeding assistance, and Activities of Daily Living (ADL) independence enhancement (morning care). A simulation analysis estimates these times for six major categories of residents with different functional limitations and care

needs that broadly define the nursing home population.

1.4 Attribution and Phase 1 Analyses

A footnote on the first page of each of the 14 chapters details the appropriate attribution and acknowledgments to often different individuals for all the analyses contained in the chapter. Although this is a HCFA Report for which it alone is responsible, each of the reports received from contractors and subcontractors has not been changed or altered in any way, other than minor editing.